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Student Medicine

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Editorial Comment

A TRAINING PROGRAM FOR STUDENT HEALTH PHYSICIANS

IN THIS issue Dr. Irvin W. Sander describes a program recently set up by the American College Health Association to provide a means whereby physicians now in or wishing to enter the field of student health work can obtain specialized training better fitting them for work in their chosen field. This new program represents an important advance in the developing specialty which deals with the medical problems of students in institutions of higher education. That it is deserving of specialty status is readily apparent from Dr. Sander's description of the duties and responsibilities of a student health physician. Here is a specialty that differs from most others, for it deals not with a narrowing field of interest but with an ever-broadening scope which even reaches outside the usual field of medicine.

It is our hope that this training program will develop as rapidly as is consistent with sound growth. There is a need for physicians with training in student medicine as more and more educational institutions are assuming an increasing or even full responsibility for the medical care of their students. The American College Health Association is to be commended for initiating a program to provide physicians who have had the sort of training which will be most valuable to schools just starting or expanding student health services.

Dr. Sander expresses the hope that funds will become available for the establishment of fellowships. This is an important goal for

which to strive, as it will avoid placing any burden on either the trainee or the institution which is to provide the training, and it will avoid some of the difficulties and inequalities which are inescapable when separate arrangements must be made between each trainee and the health service where he is to train.

The value of the training can also be increased when it becomes possible for smaller schools to participate in the educational program, because the problems in these schools may be much different from those of the larger colleges and universities. The development of a rotating type of service, with some time spent in each of several schools differing not only in size but in environment, will further augment the training.

It is expected that completion of either the one-year or the two-year course of training will be rewarded with the conferring of a diploma or certificate. This is an encouraging sign of the growing recognition of student health medicine as a specialty.

We urge that all who are interested in student health work give their support to this new undertaking by the American College Health Association. Its success will benefit all who work in this field.

THE FOURTH NATIONAL CONFERENCE ON HEALTH IN COLLEGES

The Fourth National Conference on Health in Colleges scheduled for May 5-8, 1954, in New York City, promises to be the most successful of the series which began in 1931. It deserves country-wide support of University medical and administrative officers. The previous conferences held in 1931, 1936, and 1947 were valuable in that they brought together the thinking of all those interested in college health programs and made it available to those who have the responsibility for planning new programs or improving ones already established. The group planning for the 1954 meeting anticipates a large attendance made up of college physicians, presidents, health educators, deans, specialists in physical education, college nurses, psychologists, and student counselors. All persons who have a stake in the health of college students will find interest at the conference, for it will be divided into a number of working seminars on at least

two of the four days, each seminar being under the guidance of a chairman who will have spent much time in preliminary work before the meeting. With such excellent preparation for the discussions and with the several disciplines represented at each table, there is little chance that a single specialized group of individuals will dominate the discussion. Following the conference, a volume summarizing the findings will be published.

Heading the conference is President J. L. Morrill of the University of Minnesota; Dr. Dana L. Farnsworth, President of the American College Health Association, is chairman of its Executive Committee. The Association will hold its annual 1954 meeting in conjunction with the Fourth Conference. We confidently predict a successful conclusion to this educational venture which at this early date is already sponsored by a score or more of national health organizations. Among the sponsors the National Tuberculosis Association is taking a prominent part in planning.

Subjects thus far assured of a place on the program include Research Programs, the Role of the College Nurse, Administration, Organization and Function of a Medical Service, the Health Service as an Educational Agency, Correlation of Counseling Functions on a College Campus, the Dean of Students and the Health Program, Clinical Records — Their Use and Misuse — Environment and Health, Student Participation in Health Planning, Training Programs in Student Medicine, Community Resources Which Can Contribute to College Health, the Development of the College Mental Hygiene Program, and Special Health Problems of Foreign Students. Since it is assumed that about 40 per cent of the total attendance will be physicians, it seems desirable for the physicians to be distributed throughout all the committees rather than being grouped in just a few of them.

The list of subjects for special discussion together with the names of the committee chairmen will be available at Conference Headquarters so that correspondence may be instituted directly with the committee chairman on any subject in which an individual is particularly interested. We suggest that those desiring advance information communicate with the secretary of the Executive Committee, Miss Charlotte V. Leach, 1790 Broadway, New York 19, New York.

The Relationship of a Student Health Service to Other University Departments

DANA L. FARNSWORTH, M.D.
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SUPERVISION of the health of college students has not been considered a responsibility of college administrative bodies until the last few decades, and even yet this principle is far from universally accepted. There are many good reasons for caution and great care in planning the establishment or extension of college health services. One of the most important is that if any group of people becomes accustomed to good medical care, without being concerned how it is paid for, the service comes to be considered a right and the duty of supporting it is forgotten. This leads to lack of appreciation of the effort that goes into the organization of a truly effective health service and eventually to deterioration of its quality. If a college health service wishes to be of the greatest possible service to the institution which it serves, much attention must be paid to its public relations and particularly to co-operative activities with other departments. The general purposes and scope of health programs have been repeatedly described in recent years.[1] The purpose of this paper is to point out in a somewhat more detailed way the possible opportunities of collaboration with lay colleagues in health matters. There are

[1] W. E. Forsythe, Student Health Work, *J. Higher Education, 6*:314-322, 1935; N. S. Moore and C. D. Darling, *Student Health in a Changing Order* (Ithaca, N.Y.: Cornell University Press, 1951); D. L. Farnsworth, Health in Colleges, *New England J. Med., 248*:543-552, 1953.

several departments with which frequent contact seems quite logical and "natural," but there are none who never need the health service.

OFFICE OF ADMISSIONS

A large number of colleges, possibly the majority, now require some kind of physical evaluation before the student enters. This serves several purposes. First, it enables any necessary communication from the family physician to be sent directly to the medical service so that as few mistakes as possible regarding health will be made before the entrance physical examination. Second, it will help to prevent from coming to college those students who have an infectious disease or a chronic disorder too serious to permit effective schoolwork. In this connection, it is the writer's firm belief that such procedures are not designed to keep students with poor health records out of college but rather to keep out only those who would almost certainly not succeed and to encourage others to make use of the best medical care that is obtainable. Thus a student with epilepsy should be admitted if he co-operates with his medical advisers and if his seizures are under reasonably good control. A co-operative student with arrested pulmonary tuberculosis is an acceptable risk, providing that he continues to be under close and regular supervision.

Many colleges require immunization procedures as a part of the entrance requirements. Smallpox vaccination is most often required, and a few schools require tetanus toxoid inoculations. From the educational and public health point of view it might be desirable if some consensus were developed all over the country so that these procedures would be automatic no matter what college a student attended.

In the course of examination of admission credentials there are always many records that raise questions with regard to health, making consultation of the admissions officer and the physician desirable. This is probably true more often with transfer students than with routine first admissions. Many students make poor choices originally, have a change of interests, get off to a poor start, or have emotional or physical problems and so need a change. Close attention to each individual problem is indeed worth while with these students if errors are not to be perpetuated.

REGISTRAR'S OFFICE

The main thing for the director of the health service to keep in mind here is that the registrar must be informed of any recommendations that he may make which affect the student's status in college. This applies to recommendations for leaves of absence due to health reasons and for temporary absences due to prolonged illness and to approval of requests to take less than a full schedule of studies. The latter is particularly important in view of Selective Service requirements for draft deferment.

OFFICE OF THE DEAN OF STUDENTS

The health service has more "natural" contacts with the dean's office than with any other department. These result from problems of leaves of absence, medical excuses, discipline, modifications of schedules, morale and behavior in dormitories, and the development of the educational aspects of extracurricular activities. The physician, the psychiatrist, and the health educator all have much in common with the ideals and purposes of the dean of students. Relationships of this office with the psychiatric service have recently been described in a symposium before the National Association of Student Personnel Administrators.[2]

Medical excuses from class attendance and examinations take up an inordinate amount of time of many health services without giving any great benefit to anyone. Students always evolve ways of making the system work to their apparent temporary advantage. There are many symptoms that are entirely subjective, a physician being no better judge of their presence than anyone else if the patient has misrepresented their presence. A poorly functioning system tends to encourage students to exaggerate their troubles for the secondary gains that may be obtained. Frequent conferences between the dean and the physician bring to light abuses and may result in better ways of meeting the problem of illness. At the Massachusetts Institute of Technology the entire system has been abandoned. The instructor, with the advice of the dean in rare cases, acts as the judge. He bases

[2] E. Hunt, E. F. Bowditch, B. M. Wedge, and D. L. Farnsworth, The Dean and the Psychiatrist: A Symposium, *Mental Hygiene, 37:* 177-218, 1953.

his decisions on the general record of the student and does not emphasize the immediate illness, though in cases in which there is doubt he may check with the health service to see if the student has been there for treatment. The important item is to see that no advantages result from illness, and thus health maintenance is encouraged.

In contacts between the physician and the dean it is of the greatest importance that there be no violations of confidence of the physician-patient relationship. This can be made clear to students by explanation and by demonstration over a long period that the two departments can work together for the benefit of the student and that at the same time a student may confide in the college physician just as he would in his family doctor.

STUDENT GOVERNMENT

Even though the health service is organized primarily for the benefit of the student, it is still not usual for students to participate in health service planning. In a few colleges, students are represented on health service councils. In others informal contacts are made regularly. A personal working relationship between the physicians of the health service and student government leaders is of inestimable value to all concerned, not only in occasional emergencies but in public relations generally.

DIRECTOR OF COUNSELING

If counseling is looked upon as being a part of the function of practically every teacher, then it is worth while to have frequent and easy communication between psychologists and psychiatrists of the health service and those in charge of counseling. In ordinary day to day contacts with students, health matters come up with great frequency. Sometimes these are organic in nature and at other times psychological. Since it is to be expected that each year about 10 per cent of all students in college will have emotional problems of more or less serious nature, it is quite necessary that the faculty counselors have a dependable referral service at hand. It is essential that the academic counselor think of himself not as an amateur psychotherapist but as an older, friendly colleague who is willing to help the

student in his total development. Such a counselor should have the privilege of talking with someone who is a professional in this field when he desires it or of referring a student for treatment if that seems necessary.

In-service training of faculty and student counselors is desirable and should be made as informal as possible. Possibly regularly announced meetings at intervals of one to two weeks, at which attendance is voluntary and to which either faculty or students may come, form one of the best means of in-service training. In such meetings the psychologist or psychiatrist is there not to tell the counselors what to do but rather to talk with them and participate in the general discussion so that a common point of view or method of operation is gradually developed. Methods and philosophies of counseling are so varied in United States colleges and universities that general rules are impossible. It is clear to all who work in this field that there is far more to be done than can easily be accomplished under present circumstances. Energies devoted to deciding who should do counseling might be more profitably spent trying to improve what is already present, insufficient though it may be. The idea that all contacts with students are counseling situations appeals most to this writer; if that is accepted, then all faculty members should give some thought to improving their counseling techniques.

DEPARTMENT OF ATHLETICS

Co-operation of the department of athletics with the health service is both a pleasure and a daily necessity in those colleges that maintain athletic activities as a part of the educational experience of all students. Relations are somewhat more difficult to maintain in harmonious fashion if the philosophy of the department unduly emphasizes winning teams or large gate receipts or if it includes subsidization of athletes and the maintenance of a separate medical staff and other special privileges for intercollegiate athletes.

All decisions regarding the ability of a student, from a health viewpoint, to practice or play in games should be made by the physician, not by coaches or trainers. Similarly, all injuries should be examined by the physician and their treatment performed by him or under his direction. The more skilled and experienced the trainer,

the more the physician may be able to delegate duties to him, but in any case the responsibility for major decisions in treatment and activity remains with the physician. Pressure from any source to change decisions regarding the ability of an athlete to play in a particular game should be resisted even if this results in the physician's losing his position.

A physical examination should be made before the beginning of each academic year, and a brief physical check-up before each major sport season, particularly contact sports. Thus a student who plays football only might have one examination a year, but if he were out for basketball and lacrosse, he might have two additional brief check-ups, at the beginning of the seasons for those sports. Thorndike has listed certain conditions which should thereafter prohibit participation in contact sports, including fracture-dislocations, large laparotomy or nephrectomy scars, removal of spleen or kidney, three cerebral concussions of minor degree or one brain laceration, and the loss of one eye.[3] Those who should not take part in contact sports should be encouraged to share in others that are more appropriate to their needs. In fact, the influence of the health service should be directed toward the maintenance of as broad a base of participation as possible. Intramural sports are as important as intercollegiate sports from the educational and health points of view.

PHYSICAL EDUCATION

All students who plan to participate in physical education should likewise have a physical examination before they begin. The regular examination of all students can serve this purpose. Some schools use the device of a prescription or special form which is filled out at the time of the regular physical examination and sent to the head of the physical education department in order that he may be aware of precautions to be observed for any individual student. In most schools, it is possible for practically all students to take part in some form of physical activity, but if the student has had rheumatic fever or has a ruptured eardrum, a residual from poliomyelitis, or other

[3] A. W. Thorndike, *Athletic Injuries: Prevention, Diagnosis, and Treatment* (2d ed.; Philadelphia: Lea and Febiger, 1942).

physical defects, considerable care must be exercised in making the decision as to what sports he may safely choose.

Another concept which needs furtherance is the role of the physical education instructor as counselor. He gets to know his students rather well and has about as much intimate personal contact with them as anyone else in college. He has an opportunity to see whether the student has integrity of character and whether or not he takes unethical short cuts. The physical education instructor is in a position to give encouragement and suitable advice regarding study habits. He can help convey to the student a perspective, a sense of balance, and also an awareness of the need for planning the rest of his college work. Developing an attitude of counseling will not only be of great aid to the student, but it will also enrich the work of the physical education instructor himself.

PERSONNEL OFFICE

The personnel office and the health service are jointly concerned with the physical examination of new employees and with determining policies regarding physical fitness for specific jobs. Such problems are particularly acute with food handlers and with those who handle moving machines and intricate machinery or work in high places. An enlightened policy regarding the health of employees is probably not the one which tries to keep men and women with physical disabilities out of work, but rather one which attempts to assess their capabilities and handicaps in order that they may be assigned to jobs best suited to their characteristics. A person with a decided physical handicap may be an extremely valuable employee when he is properly placed. What he lacks in versatility may be made up in increased reliability.

Problems frequently arise in which medical consultation is desirable in deciding whether a person who has been exposed to particularly difficult work conditions is entitled to a special vacation or leave of absence. At other times the beginning of physical or mental disease may call for collaborative examination of the situation without the knowledge of the patient or prospective patient.

A matter that has come up in some colleges whose employees are unionized, and will come up in others, is the extension of so-called

fringe benefits, which include medical and health privileges. If voluntary prepayment plans are to gain favor in this country, as they apparently are doing, possibly the colleges and universities may be one of the units in which such medical care can be organized.

SAFETY AND SANITATION

In those schools which have a safety officer, there should be close contact and frequent communication between him and the school physician. A part of the physician's job is to be on the lookout for any situations that may result in injury. Likewise a part of the safety officer's job is to inquire into the significance of any hazards that he may see, and in this the physician can be of considerable help to him.

Sanitary inspection of the dining services is very desirable in most colleges. Perhaps this can be done by a trained sanitary engineer in the larger colleges and universities but may have to be done by the health service in the smaller colleges. Whether or not bacteriological studies can be made of the silverware, dishes, and samples of food will depend on the budget and facilities available. In any case it is a part of the duty of the health service to see that the highest possible standards of food preparation and handling are maintained in the dining halls and fraternities.

If there are any conditions in the dormitories or classrooms which are a health hazard, it is the physician's duty to make appropriate recommendations for their correction. Improper or insufficient lighting should be called to the attention of the proper authorities.

ACADEMIC DEANS

The points of contact of the health service with the academic deans are fewer than with almost any other division or department of a college. Nevertheless there are many things, such as the demands made upon students by the curriculum, attitudes of students toward their work, or exceptions that have to be made in the case of individual students, in which communication between the academic deans and the health service is desirable. Occasionally the health personnel may be invited to participate in regular classes when subjects that come up for discussion are in their fields.

PRESIDENT'S OFFICE

Communications with the president's office are largely concerned with the development and maintenance of policy, the control of the budget, certain aspects of public relations, promotions (when health is concerned), and medical leaves of absence for staff members. The college physician should also keep the president informed of medical developments such as epidemics or serious illnesses in key personnel and be readily available to him for consultation on all health matters that affect his decisions. It is important in this regard that the physician have powers of recommendation only and not direct authority. It is likewise desirable that recommendations be made with a sufficient degree of conservatism so that they can almost always be followed, thus enabling the president to maintain confidence in his health service. One of the somewhat unusual ways in which the health service can be of help to the president's office is in protecting it from cranks and others who, because of their physical or mental condition, are unduly aggressive in pursuing their aims.

TREASURER'S AND BURSAR'S OFFICES

There are many points of contact between these offices and the health service, but they are frequently taken for granted until something goes wrong. Collection of fees or assessments, insurance premiums, and special charges call for much work in common. The aid of the bursar's office during budget-making time is essential to the health director. A special representative of the financial offices who makes himself familiar with medical problems is of great assistance in maintaining smooth relationships.

SUMMARY AND DISCUSSION

A modern progressive college or university health service is designed to promote health in the entire institution in every way possible. The traditional function of caring for the sick student is being supplemented to a constantly increasing degree by efforts to prevent illness and to build positive health through the dissemination of the principles of hygiene. To do this, contacts with practically every part

of the institution are necessary and desirable. Some of these opportunities for collaboration have been discussed. It should be made clear, however, that the health service representatives must make progress slowly and great care must be taken to respect the feelings and opinions of their academic colleagues. It is tragic for a health service to be inefficient or unappreciated; it is utterly frustrating to be oversold and undersupported. By demonstrating the possibilities inherent in close co-operation with all other divisions of an educational institution, the health service may best further the principles of health education.

Allergy Problems Encountered in a Student Medical Clinic

HENRY B. WIGHTMAN, M.D., CORNELL UNIVERSITY

THE diagnosis and treatment of diseases of allergic origin comprise a significant part of the medical problems of a student medical clinic. Ten per cent of the entering students admit some form of allergic disease in their medical history—a percentage not unlike that found in the general population. They suffer from vasomotor rhinitis, hay fever, asthma, and various dermatoses. Although the management of these cases is much the same as elsewhere, there are a few significant differences stemming from the age of these patients and from the conditions under which they live and work.

The patients may be divided into two groups: first, those who have been thoroughly studied and have had treatment prescribed before entrance to college; and second, those patients needing study, either because their former treatment was unsuccessful or because they have never had medical help.

Students in the first group often bring to the campus injection material, accompanied by directions from their home physicians, and the student medical clinic provides facilities for storing and administering these materials. The actual injection of such extracts may be done either by a staff physician or by a nurse under his direction. Students in this group need medical care or advice only occasionally and have suitable medication prescribed by their home physicians for relief of their symptoms.

In the second group an etiologic diagnosis is sought by history taking, physical examination, skin testing, and laboratory tests. If a specific cause can be found, treatment with the appropriate aller-

genic extract can be administered just as in the first group. Lacking a knowledge of the causative agent, one can offer the student only the somewhat uncertain relief afforded by the antihistaminics and other symptomatic medications.

In treating students with allergic diseases it is essential to know the potential allergens that they may encounter in their college environment. It is also important to realize that this environment is different from that of their homes and much more difficult to control. Co-operation of students is hard to obtain, for they wish to live and act as do their associates, and they often resist the recommendations of the physicians even though they may realize that the recommendations are for their own benefit. Furthermore, allergic patients must be taught to respect respiratory infections and to give these infections early and adequate care, in order to avoid such complications as sinusitis, bronchitis, and asthma. Usually respiratory infections last longer and are more difficult to control with allergic students than with their nonallergic classmates.

Vasomotor Rhinitis. This condition is commonly known as perennial hay fever and lasts throughout the year. Often patients have had symptoms for years and have become used to a "stopped-up nose." A history should be carefully taken; the nose and throat examined, paying special attention to the paranasal sinuses; skin tests made; and the environment evaluated. If skin testing reveals specific sensitivity, the student is instructed to avoid the offending material or eliminate it from his immediate environment if possible. A high percentage of these patients shows a sensitivity to house dust and will be benefited by injections of house-dust extracts, using either stock preparations or extracts made from dust collected from sites of unusual exposure. When the presence of infection is indicated by physical examination, by x-ray findings, or by bacterial cultures, the infection itself should be treated by appropriate measures. Respiratory vaccines may be useful, alone or combined with other allergens.

Hay Fever. The incidence of this condition in university students is about the same as that found in the general population. An accurate history is obtained to ascertain the time of the year at which the student has symptoms; then skin tests are performed with extracts of pollens known to be present at that time. An extensive

knowledge of the pollinating plants and their pollinating seasons is essential. In this regard it is of great value to be able to obtain information from members of the botany and floriculture departments of the university. If the student is found to react positively to one or more pollens, he is advised to have injections of extracts of the offending materials. These injections are begun ten weeks before the usual occurrence of symptoms. The student purchases stock material from one of the large supply houses and takes it home at the end of the school year so that treatment can be continued. The Cornell clinic usually cannot observe the active symptoms, since the student is not in residence here during the two major hay-fever seasons in this area—the university closes in June before the grass-pollen season reaches its peak and opens again in the fall when the ragweed pollen season is nearly over. Consequently the treatment has to be given in anticipation of these two seasons, and the physician learns the results of his treatment many weeks later, a condition not as satisfactory as personal observation. Occasionally, however, the student health physician first sees the student when he has active symptoms, and he may respond to small doses of pollen extract given at this time—the so-called co-seasonal treatment. In general, the student resists the necessary daily visits because they take so much time. Palliative measures such as nose drops, eye drops, and sedatives are used along with antihistamine drugs with varying success.

Asthma. Although this condition is common in college students, it is not as frequent or disabling as in children under fifteen years of age or in adults past middle age. The attacks of asthma are of shorter duration because of the vigorous resistance at college age and also because deep-seated infections of the sinuses, pharynx, and bronchi, so often seen in the asthmatic over forty, have not yet developed.

Again a search is made for the causative factors by careful history taking, physical examination, laboratory studies, and skin tests. Environmental observations are often of value, using a specially prepared room at the infirmary and having the student eat and sleep there while attending classes as usual. In this way living conditions can be controlled for test purposes and still the student does not lose time from classes. A knowledge of how students live and of their possible contactants is essential. The veterinary or anatomy student

may be sensitive to formalin, the agricultural student to grain and barn dusts or animal danders, and the science student to chemicals and their fumes.

Avoidance of the causative allergen is the most successful treatment of the so-called "extrinsic asthmas," and desensitization is recommended if avoidance is impossible. When the attacks come as a result of infections such as pharyngitis, bronchitis, or sinusitis, bed rest and the administration of antibiotics is advisable. Occasionally the help of a rhinologist is needed for treatment to aid in clearing nasal and sinus infections. Often a student may be helped by indirect measures: by modifying his physical training program, by arranging transportation so that he avoids hill climbing or exposure to the cold winter air, or by helping him select courses in which he will not encounter irritants.

Dermatoses. These may be divided into three groups: atopic eczema, urticaria, and contact dermatitis.

The student with atopic eczema has had it since early childhood and usually knows which contactants or foods he must avoid and also which types of clothing he can wear without aggravating the skin condition. When he experiences a flare-up, an effort is made to discover if there are new factors causing the difficulty. Skin tests are usually of little value, and reliance must be placed on history taking and careful observation. Secondary infection is a frequent complication which must be watched for and treated promptly. Fortunately for the student health physician, most of the cases he sees are mild, for the condition tends to improve as the patient becomes older and is seldom severe by the time college age is reached.

Urticaria is seen frequently. The history often reveals that the student had an injection of penicillin a week or so previously and sometimes that he has eaten some unusual food. Often there is no obvious explanation for the symptoms, and they are thought to be a result of some infection or emotional strain. Skin tests are seldom of value. A diary listing the foods eaten and the activities engaged in often helps in solving some of the obscure cases. Symptomatic relief can usually be afforded by injections of adrenalin or by the administration of an antihistamine drug or the newer cortisone.

The history and the areas of skin involvement give clues to the

specific cause of contact dermatitis. Common contactants are plants, adhesive tape, and medicaments. The physician must also consider various chemicals, animals and furs, insecticides, preservatives, and any other substances with which the student may have contact in his schoolwork or as a result of a part-time job. Patch tests are made with suspected materials, and if the patient reacts positively to any substance, he should avoid further contact with it.

Special Problems. The care and treatment of patients having sensitivities to house dust or to specific foods require comment. To avoid contact with these substances is difficult for the college student living in and eating at campus facilities.

The problem of house-dust sensitivity is a real one and most difficult to control. A high percentage of patients in their history will associate dust with their nasal symptoms, and more patients show positive skin tests to dust than to any other single substance. In the private home, dust-collecting articles can be removed from a room and the room can be cleaned daily with a damp cloth, but students live in dormitories, in fraternity or sorority houses, or in rented rooms where cleaning is not done daily. A college building, such as a gymnasium, is impossible to keep dust free in the strict sense. Boys and girls like rooms furnished with heavily upholstered lounge chairs, and these emit dust each time they are occupied. To deprive students of such sociable areas would take away one of the important factors in campus life. A boy may cover his own mattress with a dust-restricting material, but it is unlikely that he can get his two roommates to do likewise. Avoidance of dust is nearly impossible, so reliance has to be placed on immunity produced by injections. These give only limited protection and will not cover excessive exposures.

The restrictive diet is another problem which a student with food allergies faces when away from home. Students obtain their meals in dormitories, fraternities, sororities, and restaurants. It is a simple matter to avoid specific fruits, vegetables, or meats, but it is most difficult to avoid foods used in cooking such as eggs, wheat, milk, and vegetable-oil shortening. A student may be so sensitive that only a trace of the offending nutrient will produce violent symptoms. The average cook or restaurant owner cannot truthfully say whether or not certain substances are present in the foods offered. Fortunately

the number of students who have to observe these restrictions are few, but to these few it is a very real problem. At Cornell a special diet table has been established to solve this and other dietary problems. This table, as described by Dr. Young,[1] assures the student that he will not receive foods he should not eat and that he will be provided with other nutritious foods in quantity to meet caloric, protein, mineral, and vitamin requirements.

[1] Charlotte M. Young, The Nutritionist in the Student Medical Clinic, *Student Medicine*, 1 (No. 2): 25, 1953.

Side-lining with the Doctor

H. R. McPHEE, M.D., PRINCETON UNIVERSITY

WHEN the football team has completed its preparation for the game, the doctor stands near the receiving team's forty-yard line awaiting the kickoff—he knows that many of the serious injuries happen on this play and he wants to be in a good position to observe. He sees the halfback gather in the ball and start upfield. The halfback swerves and appears to have a clear path as his teammates start blocking off the center alley. He has gained full speed, and a touchdown looks certain. Suddenly a dark blur enters obliquely, hitting close to knee level while the toes of the halfback's left foot are still in contact with the ground. A divot rises as the leg is knocked backward. The back comes to a stop after careening three or four feet into the air. As he writhes, the doctor quickly inspects the knee and is relieved that it is not completely dislocated. The turf mercifully yielded in time. The relief does not banish the doctor's concern, for there is some antero-posterior play and lateral laxity. The injured player is removed by stretcher to the dressing room, where the doctor makes him comfortable and starts early therapy in the form of pressure pads and cold packs before moving him to the hospital.

The fullback comes out of a spin and heads for a hole in the line. The opposing backer-up avoids a blocker but puts himself in an awkward position for the tackle. As he tries, the fullback's knee catches him on the forehead and they both go down. The tackler does not get up, so the doctor starts for the field, realizing that he faces the most ticklish situation in college sports—a decision concerning a student who has been rendered unconscious by a blow on the head. The odds are good that the downed tackler will recover consciousness before the doctor reaches him and even better that he will recover completely even though he regains consciousness with a little delay. But what bothers any doctor is the knowledge that the largest

percentage of fatalities in athletics is due to head injuries and that there is a condition commonly called "punchy." This is one time when it is a good policy to err on the side of safety. If the unconsciousness is more than fleeting or if there is any evidence of loss of memory, any disorientation, any dizziness, headache, or nystagmus, the doctor takes the player off the field on a stretcher or walks at his side, as conditions warrant. Whether he returns to the game later depends upon how soon and how completely he clears up. Sometimes the doctor will reach the field to find a well-oriented and very normal individual and will decide to let him continue. It is a good plan to have the fellow next to him signal if there are any indications of missed assignments in the next few plays. The doctor, the head trainer, and possibly the coach should also watch him, because a doctor cannot have too many checks on a man with a concussion.

A halfback is tackled from the rear by two men, and as the human mass hits the ground, his right shoulder assumes the role of a plow point. He keeps the ball but he is in distress. The doctor's hand slips gently down the right side of his neck and under the shoulder pad. It encounters a projecting mass that is startling. The outer moorings of the clavicle are completely detached, and the bone bisects the angle between the neck and the shoulder. The doctor places the player's right arm against his body with his forearm across his chest, and the player holds and supports it with his left hand. He is placed on a stretcher and taken to the hospital for x-rays and surgical care.

An angry exclamation escapes as the doctor sees a man injured by being clipped from the rear. The foot, the ankle, the knee, the tibia, the fibula, and the muscles all need close inspection. There usually is no question about returning him to the game. He is fortunate if he plays in two or three weeks or at all. He is removed to the side line on a stretcher or supported by two men, whichever good judgment dictates. After careful inspection, the doctor decides whether to send him to the dressing room for initial treatment or to apply support and a cold pack and permit him to see the remainder of the game.

It was a beautiful tackle, but the guard who made it is hopping around with his left hand grasping the opposite shoulder and his right arm dangling. He has bruised the cervical plexus. Gentle mas-

sage of the neck and arm relieves the tingling and restores function. It is the second time that this has happened to the guard, and the doctor insists that in the future he wear a special pad to protect the area. These patients should be x-rayed, especially the first time the injury occurs. A cervical rib or an extra-long transverse process on the seventh cervical may be the cause, and in this case it might be possible, by using a special brace or collar, to prevent the head from being forced over far enough to pinch the nerves.

The doctor sees various mishaps at football games and comes to associate certain patterns of tissue damage with certain types of injury. This correlation is an asset when the doctor is working under the limited-substitution rule which requires him to make a quick decision on the field. If he sees the injury occur or gets a brief statement of what took place, he knows what to look for, but he must keep in mind the pitfalls of a preconceived diagnosis.

When an injury is severe, he removes the player from the game with the full accord of everyone, but many mishaps appear minor to others, and they are the kind that give a doctor the most trouble, especially if he is sensitive to dislocated eyebrows. He can expect many of these with the change in the rules. The eyebrows of the players go down in a scowl at the idea of leaving the game, and those of the coaching staff go up. The doctor must become inured to criticism and exercise his best judgment in each individual case, for basically people are interested in good health and complain most after it is lost. For several years past it was possible to remove from the game these players with minor injuries and to inspect them carefully under conditions that were reasonably satisfactory. The doctor could reach a sound judgment as to whether the student could continue without doing himself serious harm. A little support or protection well applied often accomplished what was needed, and the coach could return the player to the lineup without much further delay. Today the doctor must make a hurried inspection, reach a snap decision, and apply the support in the few minutes allowed or remove the man from the field to await the next quarter of play.

The rule change is a step backward in the matter of dealing with football injuries during the game. Examining a Charley horse through football pants or a hyperextended elbow through the pad-

ded sleeve of a jersey leaves much to be desired, and yet a decision must be made. In haste the doctor weighs a number of factors: the stage of the game, the importance of the competition, the ability of the substitute, the schedule ahead, and, most important, the man himself. The doctor must know everyone on the squad, for if he does not, he is greatly handicapped. Some men will greatly minimize an injury and even camouflage its existence, thus inviting more serious damage, rather than risk the possibility of being removed for an extended period. If, after considering all these factors, the doctor decides to let the player with the Charley horse continue playing, he shifts the pant leg so that the thigh guard protects the spot and tries to make it stay by snugly taping in circular fashion. If the player with the injured elbow is to stay in the game, the doctor tapes across the anterior surface of the flexed elbow. The doctor walks to the side line, while the crowd applauds that the star can continue. But the doctor is scarcely conscious of it because his mind is occupied with the hope that the taping holds and with the wish that there had been time to do a better job.

The Training Program for Student Health Physicians

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SINCE the organization of the first college health service in the middle of the nineteenth century (Amherst, 1856), this field of medical practice has undergone a slow but steady evolution and growth. The first health services to be organized were largely built around the athletic activities of students and were basically first-aid stations for the treatment of injuries. Other students received little or no service, and an inclusive health supervisory program for all students, as we know it today, was not thought of.

During the almost one hundred years that have elapsed since these beginnings, many changes have occurred. The increase in medical knowledge and in the skill and training of physicians has been tremendous. From the study of the effects of disease and its treatment we have turned to a greater emphasis on the study of the cause of disease and its prevention.

The voluminous medical literature of our time is indicative of the strides that have been taken in all fields of medical care. The development of the various specialties is a natural result of the inability of one person to be cognizant of the progress in all fields of medical practice. And changes have occurred, too, in college health services, both in philosophy and program. Most college administrators now believe that their institution must assume some responsibility for the health of its students. Many of the students are away from home for the first time in their lives and for the first time are without parental supervision of their health and health habits. Therefore the college must in some degree take the place of the parent in providing health care for the student and also in providing a healthful environment in which the student can live and study.

Health service programs vary considerably in the different colleges, depending on the size of the school, the medical personnel available, and the available equipment and space. Certain procedures are fairly universal. Entrance physical examinations, or at least a record of such an examination by the family physician, are usually required. Chest x-rays, certain biological tests and immunizations, a check of vision and hearing, a determination of cardiac status, and the presence or absence of hernia represent the type of health information desired by the college for all students. In this manner contagious diseases are eliminated, and permission for the student to engage in certain college activities can be intelligently given.

The college health physician will usually have certain responsibilities relative to the environment of the student. He may be called on to supervise dormitories, fraternity and sorority houses, food and sanitation in college eating places, swimming pools and dressing rooms, rest rooms, and other public facilities. If there is an infirmary for ill students, the physician will be a hospital superintendent as well. He will be asked to consult with admissions officers regarding certain types of health problems and the advisability of admitting students so afflicted. He will have to work closely with athletic coaches and health education instructors to enable them to fulfill their obligations most beneficially for the student.

Personal counseling with students on health problems, both physical and emotional, always demands considerable time of the health service physician. He must be able to develop adequate rapport with the bookworm as well as with the student allergic to study. If a psychiatrist or mental hygiene counselor is available, his load will be much lighter; if not, he must be able to recognize serious emotional problems and arrange for proper handling.

In most colleges the school physician will have academic rank and tenure. Because of the wide range and variety of his duties, he will be a teacher and administrator as well as a physician. He must, therefore, recognize not only his duties to his patients as their physician but also his obligations to his college as a member of its staff. Occasionally what may be best for his patient may not be proper procedure for the college; administrative regulations do not always work

for the best interests of the patient. This distinction is a fine and difficult one and will require a high degree of diplomacy and persuasion on the part of the physician.

All of the foregoing is merely a long way of stating a simple fact—that the college physician is a specialist in a particular and important field of professional activity. He must first of all be a physician, and a good one. He must be skilled in the diagnosis and treatment of ills to which the college age group is prone. His activities will embrace more than medical care, but they all contribute directly to the health and well-being of the students under his care. Call this "college medicine," or "student medicine," or "hebeatrics,"[1] or whatever term may seem most descriptive. The important fact is that this work requires special training and understanding in the specific field to which it is applied.

Up to the present time, training in this specialty has been obtained almost entirely through experience. Many physicians have found themselves engaged in the work through an accidental combination of circumstances. They have found it challenging and interesting and have remained. Others have begun their careers in health service by design, but have found it difficult to obtain any form of training which would enable them to acquire the desired skills and understanding more efficiently than by trial and error.

The American College Health Association, founded in 1920 by a group of physicians as an organization for persons engaged in college health work, has frequently in recent years been asked by college administrators for advice in the selection and appointment of a physician capable of directing a college health program. Such advice has usually been difficult to give because of the limited number of trained physicians available.

The Association has therefore this year set up a program for the training of physicians in student health work. Five universities in the United States will offer, through their health services, an opportunity for interested physicians to acquire in one or two years the skills needed to assist them in college or university work.

The one-year program is intended for the older physician who,

[1] R. I. Canuteson, *Proc. A.C.H.A.* (Stanford: Stanford University Press, 1952), p. 15.

after a number of years in practice, may desire to enter student health work for any one of a variety of reasons. Because of his practical experience, one year should be adequate to acquaint him with the special problems and philosophy of student health work.

The two-year program is intended for the younger man or woman just finishing an internship, or perhaps more extensive hospital training, who may desire to enter student health work with the expectation of making it a career. Such physicians, lacking extended experience in the care of patients, will spend more time in the training program acquiring such skills.

Emphasis in both programs will be on the clinical portion of health service work. However, sufficient time will be allocated to allow the trainee to become familiar with the problems of other divisions of the school. Clinical work will take about 70 per cent of the trainee's time. Approximately 30 per cent of his time will be devoted to familiarizing himself with such subjects as health service administration, hospital supervision, correlation of health service with problems of admissions, health education, dormitory supervision, environmental sanitation, medical social service, and general college administrative problems.

The exact amount of time to be spent in each area will vary with the school. In general, all subjects mentioned and possibly some others will be covered. The supervisor of the program will be the director of the health service where the trainee enrolls.

As a physician, the trainee will, of course, render during this period valuable service to the health service where he trains. It is expected, therefore, that he shall be paid in proportion to the minimum salary established for that health service. Efforts are being made to find funds from various sources so that eventually a standard stipend will be available, provided in part from fellowship funds, for all trainees regardless of the college where they may train. It is hoped also that in time trainees may be rotated through several health services during their training period. This should provide a broader base of experience upon which they can build.

It is the plan of the American College Health Association to confer upon the physicians who successfully complete the above program a diploma or certificate attesting their competence in student health

work. We hope that this ceremony will eventually become a regular and dignified part of the annual meetings of the Association.

The five universities which will provide a pilot program to begin in September 1953 are named below, together with the director of the health service in each school.

University of California, Ernest V. Cowell Memorial Hospital, Berkeley 4, California, William G. Donald, M.D.

Cornell University, Ithaca, New York, Norman S. Moore, M.D.

University of Kansas, Lawrence, Kansas, Ralph Canuteson, M.D.

University of Michigan, Ann Arbor, Michigan, Warren Forsythe, M.D.

University of Minnesota, Minneapolis, Minnesota, Ruth Boynton, M.D.

It is hoped that eventually trainees will be able to make arrangements for undertaking the program through the American College Health Association. In the meantime, it is suggested that interested physicians correspond directly with the director of the health service in the school of their choice. All financial arrangements will be made with the individual director.

Further information regarding the general arrangement and philosophy of the program may be obtained by inquiry of the Secretary of the American College Health Association, Dr. Edith Lindsay, School of Public Health, University of California, Berkeley 4, California, or from the author of this paper.

The Vaginal Smear Method in the Study of Adolescent Amenorrheas

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A COLLEGE gynecological service with its large number of late adolescents offers an excellent opportunity to study functional menstrual problems, as well as occasional interesting organic lesions. Many of the menstrual disorders may have been initiated by the move from the protected home situation to the highly competitive and often overactive situation of college and dormitory life. Others have existed intermittently since the menarche and may or may not have received previous medical consideration.

To list the problems met over several years in a college gynecological service is to enumerate most of the known menstrual disorders with the exception of the most unusual tumors and congenital defects. Amenorrhea is by far the most frequent menstrual disorder of the late adolescent age group. Rarely will this be primary, delayed menarche. It is usually secondary amenorrhea, postmenarcheal, and of varying duration and significance.

The menarche varies in its onset from the tenth to the seventeenth year, and menstruation frequently requires from two to three or even four years to establish its mature rhythm. Hence absence of menstruation can hardly be considered amenorrhea unless a year or more elapses between the first and second periods, or an interval of six months or more occurs after the mature pattern has been established. It would seem unwise, therefore, to indicate concern within that range of time and certainly inadvisable to give endocrines in an at-

tempt to establish immediate rhythm.[1] Yet a patient should not be dismissed without an adequate history and examination to assure that there is no systemic reason or even pregnancy to cause the delayed periods.

Study of actual amenorrhea must include a complete family history of endocrine disorders and systemic diseases. It must likewise include a detailed past history of the patient with the course of all her illnesses and their relation in time to the menarche and to her amenorrhea. Her menstrual history must be as exact as possible with dates and character of flow, its duration, and midcycle events. One must know in general how her time is spent. Her pattern of activity may include no relaxing exercise and recreation and little rest, with the candle burned at both ends. The entire diet history is needed—so often there have been fat and lean periods, periods of overindulgence in food followed by unwise restrictions. Her social adjustments now and in the past must be known. She is often insecure, immature, and struggling with responsibilities which she has gained but for which she feels most inadequate. She is sometimes quite withdrawn, perhaps entirely asocial. She may be in conflict with an overprotective and demanding home situation. In serious problems, the physician is fortunate who can secure the aid of a well-functioning mental hygiene clinic. Otherwise, as in general practice, the physician's own knowledge of psychosomatic medicine must be applied, and aid from a specialist sought elsewhere, if needed.

The physical examination must be sufficiently complete to appraise the patient's general nutritional status, her body build and structural defects, her secondary sexual characteristics, and evidence of any systemic disease or chronic infection. It should include an inspection of the external genitalia and either bimanual rectal or vaginal examination to determine uterine development. It should also include an examination of the optic fundi and visual fields, although neither shows abnormality in most early pituitary tumors.

The normal cyclic hormone and nervous mechanism stimulates a normal endometrium to progressive growth, at first proliferative and

[1] N. B. Talbot, E. H. Sobel, J. W. McArthur, and J. D. Crawford, *Functional Endocrinology from Birth through Adolescence* (Cambridge: Harvard University Press, 1952).

then secretory, followed by a short period of regression with menstruation finally ending that cycle and even overlapping the beginning of the next cycle. In the rodent and presumably in the human, the pituitary releases follicle-stimulating hormone (FSH) which stimulates ovarian follicle growth but not ovarian hormone formation. Under the influence of the normally functioning hypothalamus, the pituitary releases small amounts of its luteinizing hormone (LH). This causes further growth of the follicle and stimulates it to produce estrogen. With increasing estrogen production, LH is released in larger quantities and ovulation and the formation of the corpus luteum occur. But apparently luteotropin from the pituitary must also be present at this stage to cause the corpus luteum to persist for a few days and to secrete progestational hormone until the withdrawal of estrogen and progesterone brings about desquamation of the endometrium. The cyclic recurrence of this activity results from the estrongenic hormone inhibiting the FSH while stimulating the liberation of LH; the progestational hormone then inhibits the LH, with sufficient lag to produce cyclic activity instead of equilibrium. These gonadotropins (FSH, LH, and luteotropins), pituitary hormones, first appear in the adolescent in sufficient amounts for urinary assay a few months before the menarche. The amount thereafter fluctuates with the menstrual cycle, reaching a maximum at ovulation and possibly another peak before falling sharply prior to menstruation. They increase markedly in ovarian hypofunction, in the early weeks of pregnancy, and at the menopause. They are absent in destructive lesions of the pituitary.[2]

In the human of about three to seven years of age a measurable quantity of estrogen is present in the urine. An increase occurs in females at about eight years, and a second sharp increase at about eleven years of age. The early source is probably the adrenal cortex. It is believed that the stimulus to the pituitary to release enough gonadotropin to stimulate ovarian follicle growth in adolescence comes from a neural or neuro-hormonal mechanism, inhibited during childhood.[3]

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[2] *Ibid.;* see also A. Cantarow and M. Trumper, *Clinical Biochemistry* (Philadelphia: Saunders, 1949).

[3] Talbot *et al., op. cit.*

In cases of true amenorrhea, an immediate appraisal is needed of the functioning of the patient's ovaries in terms of estrogen production in order to judge whether the break in the cycle is traceable to ovarian or pituitary failure or hypothalamic inhibitions. For preliminary study a laboratory test, which alone would be adequate in many cases, is highly desirable. Such a test often could obviate the necessity of urinary estrogenic and gonadotropic assay, both of which are seldom available for the average college health service, and of endometrial biopsy, a traumatizing experience to be avoided if possible. The vaginal smear method meets this need and is a simple and valuable means of estimating the day to day production of estrogen, as well as one which can be easily used in office practice. This method is inexpensive and nontraumatizing and can be used throughout the cycle, if necessary, to evaluate qualitatively and quantitatively the estrogenic production. So significant is it, that it can be used in prognosis of the severity of the amenorrhea.[4]

This method of cytologic study of the human menstrual cycle is the outgrowth of a careful study by Stockard and Papanicolaou of the rhythmical "heat period" in guinea pigs.[5] That study was later extended by numerous scientists to cover a variety of mammals and to include the human vaginal epithelium. It became of real importance to medicine when Papanicolaou applied it to the human menstrual cycle and studied hundreds of series of smears from normal and pathological cases throughout many cycles.[6] His vaginal smear studies with Shorr were varied, including smears from menopausal patients before, during, and after estrogen therapy, amenorrhea patients under treatment with gonadotropic hormones and routine smears from a large number of clinic and hospital gynecological patients, especially preoperative cases.[7] These smear studies were correlated with operative findings, biopsy, and tissue diagnoses and with bioassays for hormonal activity until the normal physiological condi-

[4] E. Shorr, An Evaluation of the Clinical Applications of the Vaginal Smear Method, *J. Mt. Sinai Hosp., N.Y., 12*:667, 1917.

[5] C. R. Stockard and G. N. Papanicolaou, A Rhythmical "Heat Period" in Guinea Pigs, *Science, 46*:42, 1917.

[6] G. N. Papanicolaou, The Sexual Cycle in the Human Female as Revealed by Vaginal Smears, *Am. J. Anat., 52* (supplement):519.

tions as evidenced in vaginal smears were differentiated from the many pathological smears. The vaginal smear method has limitations of usefulness and does not replace biopsy and the urinary assay for estrogens and gonadotropins, and the chemical measurement of urinary pregnandiol in especially difficult cases. It is, however, an extremely valuable single measure of ovarian function in most cases.

The preparation of vaginal smears is simple and requires no expensive equipment. Vaginal fluid from the posterior fornix is aspirated by means of a dry, slightly curved, glass pipette having a rounded tip and small opening and fitted with a strong rubber bulb for suction. The fluid is spread immediately upon a clean, dry slide and then fixed instantly by dropping into a jar containing equal parts of ether and 95 per cent alcohol. Only one minute or two of fixation in this solution is necessary before the slide can be placed in the Clinichrome Single Differential Stain (Shorr),[8] where it remains for two minutes. However, it can be left safely in the fixing solution for a week or two before staining without damage to the smear. After being removed from the staining solution, the slide is blotted and dipped rapidly several times successively through 80 per cent alcohol, 95 per cent alcohol, and xylol-absolute alcohol solutions. It is then cleared in xylol for a moment and mounted with damar or other mounting fluid and cover slip. The entire process of staining and mounting requires only three or four minutes. Since the smear is now permanent, it can be studied at one's leisure. The more complicated Papanicolaou stain necessary for cytologic study for cancer diagnosis can be used for endocrine study but requires more staining equipment and more time for both fixing and staining.

The cytology of smears is well defined and varies from such extremes of ovarian function as are found in the menopause and some amenorrheas with their small, round, basophilic-staining basal cells to the full estrogenic effect of ovulation with its large, discrete, aci-

[7] G. N. Papanicolaou and E. Shorr, The Action of Ovarian Follicular Hormone in the Menopause, as Indicated by Vaginal Smears, *Am. J. Obstet. and Gynecol., 31*:806, 1936; E. Shorr and G. N. Papanicolaou, Action of Gonadotropic Hormones in Amenorrhea, as Evaluated in Vaginal Smears, *Proc. Soc. Exp. Biol. and Med., 41*:629, 1939.

[8] Obtained from Wyeth, Inc., Philadelphia.

dophilic-staining squamous cells. Between those extremes differentiation is progressive. An easily prepared series of menopausal smears will show day to day changes under regular estrogen therapy up to the full estrogenic effect of ovulation and then the progressive regression to the atrophic smear on cessation of treatment.[9] Similar studies may be made of the smears of the normal menstrual cycles and of those of the amenorrheas and menorrhagias. One soon finds variations from the so-called normal that require aid in interpretation. In the early chapters of *Diagnosis of Uterine Cancer,* by G. N. Papanicolaou and H. F. Traut,[10] directions are given for preparation of vaginal smears along with aids toward the classification of cell types and the cytology of the normal sex cycle and its variations in pregnancy, abortion, menopause, amenorrhea, hyperestrin and endometrial hyperplasia, and infections. Illustrations in color include both drawings of the cell types and photomicrographs of stained smears. The technique of preparing and staining smears is described clearly by de Allende, Shorr, and Hartman.[11] Description of cells in various phases of the menstrual cycle, with graphs of the numerical variation in cell types in both ovulatory and anovulatory cycles and photomicrographs of stained slides of comparable periods in the normal cycles of the rhesus monkey and the human, are included. The application of the vaginal smear cytologic study to the management of amenorrhea, to the study of infertility and menorrhagia, and to the management of androgen therapy has been widely studied and presented by Shorr.[12] He also presents the classification of distinctive vaginal smear types used below.

Familiarity with the usual variations in vaginal smears is prerequisite to use of the vaginal smear method in the study of amenorrhea. Probably the most frequent and valuable use of this method is when normal or mildly subfunctional cyclic smears indicate that a patient can be effectively reassured that her difficulty is temporary. In case of atrophic smears, or subfunctional acyclic ones, the physician must

[9] Shorr, *op. cit.*

[10] G. N. Papanicolaou and H. F. Traut, *Diagnosis of Uterine Cancer by the Vaginal Smear* (New York; The Commonwealth Fund, 1943).

[11] I. W. C. de Allende, E. Shorr, and C. G. Hartman, *Contributions to Embryology, 31*:1, 1943.

[12] Shorr, *op. cit.*

occasionally seek further for the cause. To establish a diagnosis, urinary assays and biopsy may be needed. At our clinic atrophic smears were found in patients with primary amenorrheas, chromophobe tumors, ovarian tumors, uncontrolled diabetes, and severe liver damage and during severe psychogenic disturbances. With removal of ovarian tumors and control of systemic illness the smears have returned to normal. Subfunctional acyclic smears seem usually to be on a functional basis; such cases have a better prognosis than functional ones with atrophic smears. However, smears from one of our patients with a chromophobe tumor were of the subfunctional acyclic type. Hence it is well to have an x-ray of the sella turcica in all such cases, since a pituitary tumor cannot be ruled out by a study of the optic fundi and visual fields alone. A small proportion of our patients with functional uterine bleeding, metropathia hemorrhagica, showed vaginal smears of the hyperfunctional acyclic type, but the majority have shown subfunctional cyclic smears.

In many college health services where the number of women students is reasonably large, the vaginal smear technique in the study of amenorrhea and other menstrual difficulties would be worth the small expense and time involved in its use. In both diagnosis and prognosis of menstrual disorders and in the control of endocrine therapy, the vaginal smear study has been found to be a useful and dependable aid.